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REMARKS

Claims 1-21 are pending.

No new subject matter has been added to the specification or claims.

Claims 16-21 have been allowed.

Claims 1-5, 9-10 and 14-15 were rejected under 35 U.S.C. §103(a) over Cleary et al. (US 6,457,823) in view of Uchiyama et al. (US 5,748,208). This rejection is respectfully traversed as follows.

In determining a prima facie case for obviousness under 35 U.S.C. §103, it is necessary to show that the combination of prior art teachings is proper, and that those teachings are sufficient to suggest making the claimed modifications to one of ordinary skill in the art.

Cleary discloses an ink jet printing method and print head arrangement wherein a carriage holds a series of ink jet print heads which may deposit four layers of ink simultaneously on a region of the substrate located beneath the four sets of print heads (Cleary col.4, lines 39-43). Cleary further discloses that the paths w1-w2-w3 successively printed with the print head arrangement do not overlap (Cleary col. 5, lines 17-34). Cleary thereby implicitly discloses that during the printing of a single path, the ink drops from the four different colors of ink may be printed drop-on-drop before they are exposed to an amount of energy, referred to as the "set energy".

Cleary does not disclose that successive ink drops printed drop-on-drop have a different viscosity, surface tension or curing speed. Cleary neither disclose that the viscosity, surface tension or curing speed of ink drops printed drop-on-drop vary in a graduated manner within a given range from the first to the last drop applied.

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The disclosure of Uchiyama (U.S. Pat. 5,748,208) is in the same field and deals with the same problem as the disclosure of Koike which was discussed in response to the previous Office Action. The problem addressed in both Uchiyama and Koike is how to reduce bleeding along an edge between a color area and a black area on an ink jet print. The solution presented by Uchiyama however is different from that presented by Koike.

Basically, Uchiyama teaches the use of a **'pre-coat of a color ink'** at the edge between the black area and the color area. Uchiyama discloses in Col.3, lines 14-20: *"it is primarily important not to cause a difference in penetrability of the ink into the recording medium between both sides of the boundary when a portion to be black is in contact with a portion to be colored. Therefore, there is no particular limitation on the color of the ink applied to a portion to be rendered black prior to applying a black ink to the portion"*. The application of a color ink first before applying the black ink is to be interpreted as the application of a pre-coat in order to set consistent ink penetration properties of the recording medium at the edge between an area to be black printed and an area to be color printed. Note that the color ink applied as a pre-coat for the black ink is not contributing to the color reproduction process of an ink jet printer. In fact, Uchiyama discloses that the color of the pre-coat is irrelevant.

Uchiyama further discloses in col.2, lines 58-60: *"the applied color ink is penetrated into the recording medium. Black ink droplets are next applied to the region"*. This citation further specifies a two-step process of first applying a pre-coat (of a color ink) and subsequently applying a black ink after the pre-coat has penetrated into the recording medium.

The term 'penetration' in the Uchiyama disclosure is to be interpreted as equivalent to 'curing' in the patent application under examination, for the following reason. The Uchiyama

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disclosure deals with water-base ink jet inks, which were state of the art for ink jet printing in the early 90's when the Uchiyama invention was made. Water-base inks are set through penetration/absorption into the recording medium. That is, when a water-base ink is penetrated/absorbed into the recording medium, the printed image is considered to be 'dry' or at least 'touch-dry'. In the claimed invention, the ink is a curable ink which is set or solidified through curing. Therefore, curing is equivalent to penetration, as far as setting of ink jet inks is concerned. (see also the application as filed, first page, last paragraph)

Therefore, with the terms of the claimed invention, the Uchiyama process comprises the steps of applying a first ink drop (color) to a substrate, and applying a second ink drop (black) on to the first ink drop **after intermediate solidification** of the first ink drop. This is clearly the opposite of the claimed invention (e.g. see claim 1 which explicitly states "applying a second ink drop onto the first ink drop **without** intermediate solidification of the first ink drop").

It is further important to note that in Uchiyama, Col.3, lines 51-55, it is disclosed that: *"since a difference in the penetrability into the recording medium, fixation time, etc. between color inks is not much favorable, it is preferred for the surface tensions of the color inks to be substantially the same". Uchiyama therefore teaches away from the current invention which claims inks having a different surface tension and curing speed (see claim 1), except for the black ink which as a consequence requires a pre-coat in order to restore the substantially same penetrability.*

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The combination of Cleary with Uchiyama is improper since Uchiyama solves image quality problems in an ink jet process with water-base ink jet inks, and Cleary deals with radiation curable inks (not water based inks). Whereas in Uchiyama ink penetrability into the recording medium is important for ink jet inks that are set by penetration/absorption into the printing substrate, this is not relevant for radiation curable ink jet inks that are set by solidification onto the printing substrate by means of an amount of "set energy", as disclosed by Cleary.

As argued above, Cleary does not disclose that successive ink drops printed drop-on-drop have a different viscosity, surface tension or curing speed. Further, Uchiyama does not overcome this shortcoming of Cleary and in fact teaches away from the invention by teaching that the "surface tensions of the color inks to be (sic) substantially the same". In other words even if Clear and Uchiyama were combined, the combination would not yield the current invention.

The prior art made of record and not relied upon has been reviewed but is not considered material to the patentability of the invention.

It should be noted that the above arguments are directed towards certain patentable distinctions between the claims and the prior art cited. However, the patentable distinctions between the pending claims and the prior art cited are not necessarily limited to those discussed above.

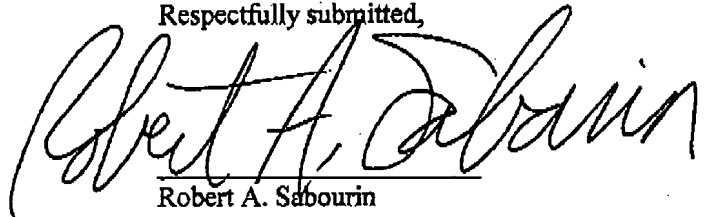
In view of the foregoing remarks and amendments, it is respectfully submitted that each rejection of the Office Action has been addressed and overcome so that this application is now in condition for allowance. The Examiner is respectfully requested to reconsider the

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application, withdraw the rejections and/or objections, and pass the application to issue. Should questions arise during examination, the Examiner is welcome to contact the applicant's attorney as listed below.

Respectfully submitted,

A handwritten signature in black ink, reading "Robert A. Sabourin". The signature is fluid and cursive, with the first name "Robert" being the most prominent.

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RAS/pc